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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/774,948
Filing Date: February 10, 2004
Appellant(s): ASTROM ET AL.

_____Astrom et al _____

For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 4/18/2011 appealing from the Office action mailed 8/30/2010.

(1) Real Party in Interest

The examiner has not comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of claims

The statement in the brief is correct.

(4) Status of Amendments After Final

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

(5) Summary of Claimed Subject Matter

The examiner has no comment on the summary of claimed subject matter contained in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

(8) Evidence Relied On

Takashi et al	US 3,719,775	03-1970
Hsu et al	US 6,934,420	08-2005

(9) Grounds of rejection

Ground of rejection from Office Action dated 8/30/2010

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 7/30/2010 have been fully considered but they are not persuasive.

Applicant's argument – (page 7-9) Takashi does not teach determination of an object scattering property for the specific location.

Examiner's response – Examiner respectfully disagree. Takashi further discloses in figure 9 and column 5 lines 25-55 where a graph discloses the sensitivity of scattered light/property of object or location over time with consideration such as fine particles in the atmosphere as well. Where Examiner see sensitivity as a determination of an object scatter property.

All dependent claims stand or fall with the rejection of the independent claims.

35 USC 102 – Claim Rejection

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 17-20, 26-31 and 37-38 are rejected under 35 U.S.C. 102(b) as being unpatentable over Takashi et al (US 3,719,775).

(1) Regarding claim 17, similarly claim 28:

Takashi et al teaches the following subject matter:

- casting incident light in a linear shape from one light source onto a specific location on an object

[figure 1, figure 4-8 and column 2 lines 45-60 (linear laser light for scanning object)];

- capturing detected light with one image sensor while casting the incident light, the detected light including at least

  [figure 2, especially part 7 and column 3 lines 59-75 (optical system to pick up light)]

  - (i) light from reflection of the incident light

    [figure 9, especially data plotting reflection signal and column 5 lines 15-50], and

  - (ii) light from scattering of the incident light

    [figure 9, especially data plot of scattered light and column 5 lines 15-50];

- generating a record associated with the specific location from the detected light, the record including at least

  [column 2 lines 45-60 (information relating to 3D condition of object between time radiating the laser)]

  - (i) first information about the reflection of the incident light

    [figure 9, especially data plotting reflection signal and column 5 lines 15-50], and

  - (ii) second information about the scattering of the incident light

    [figure 9, especially data plot of scattered light and column 5 lines 15-50]; and

- determining an object profile for the specific location and an object scattering property for the specific location by reading the first and second information in the record associated with the specific location

[column 2 lines 45-62, especially lines 59-62 (3D condition between time scans) and column 6 lines 65-70 (system for special object for which image pickup system is used), figure 9 (sensitivity of scattered light) and column 5 lines 25-55 (detail of figure 9)].

(2) Regarding claim 18, similarly claim 29:

Takashi et al further teaches:

- wherein generating the record comprises forming a first image from the captured light

[column 2 lines 45-60 (obtaining 2D image from reflected light as well as 3D condition of foreground object)].

(3) Regarding claim 19, similarly claim 30:

Takashi et al further teaches:

- the light source is a laser forming a line of laser light on the object

[figure 1 and figure 4 and column 2 lines 45-51 (laser ling into a long linear laser light on object for scanning)];

- the first image contains a profile corresponding to the line of laser light on the object

[column 2 lines 55-60 (2D image from reflected signal, as well as 3D condition of foreground object can be obtained)];

- the object profile is determined using the profile in the first image

[column 2 lines 55-60 (3D information of foreground object, wherein 3D is seen as object profile)]; and

- the object scattering property is determined using an intensity distribution of the profile in the first image

[figure 9, especially plotted scattered light and column 5 lines 25-50 (intensity of scattered light affect on image)].

(3) Regarding claim 20, similarly claim 31:

Takashi et al further teaches:

- identifying a middle area and an edge area in the intensity distribution

[figure 9, especially t3 for middle area and other times for edges and column 5 lines 15-53]; and

- comparing an intensity in the edge area with at least an intensity in the middle area

[figure 9 and column 5 lines 15-53].

(4) Regarding claim 26, similarly claim 37:

Takashi et al further teaches:

- wherein the object is elongate in one direction essentially perpendicular to the linear shape of the incident light

[figure 1 and 4, column 4 lines 44-50 (radiated line perpendicular to airplane)].

(5) Regarding claim 27, similarly claim 38:

Takashi et al further teaches:

- wherein at least one of the light source and the object is moving while the incident light is cast and the detected light is captured

[column 5 lines 1-5 and column 7 lines 30-45 (movable or stationary body for light capture)].

35 USC 103 – Claim Rejection

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 21-25 and 32-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takashi et al (US 3,719,775) as applied to claims 17 and 29 above respectively, and further in view of Hsu et al (US 6,934,420).

(1) Regarding claim 21, similarly claim 32:

Takashi et al teaches all the subject matter above, but not the following subject matter:

- wherein generating the record further comprises processing the first image to generate a second image having a reduced data quantity compared to the first image.

Hsu et al teaches the following subject matter:

- wherein generating the record further comprises processing the first image to generate a second image having a reduced data quantity compared to the first image

  [figures 4-6 and column 7 lines 17-51 (wavelet transformation, where wavelet images are of reduce quantity)].

It would have been obvious to one skill in the art at the time of the invention to modify Takashi et al by Hsu et al such arrangement would advantageously offer much computation savings as disclose by Hsu et al in column 7 lines 50-51.

(2) Regarding claim 22, similarly claim 33:

- wherein the first image includes image information distributed in rows and columns that represents at least part of the linear shape, and wherein the method further comprises:
  - (i) successively selecting respective subsets of the rows

    [figures 4-6 and column 7 lines 17-51];

- (ii) for each row in each of the subsets, determining whether the row's portion of the image information meets a criterion, and if so registering in the record any of the columns where the criterion is exceeded **[figures 4-6 and column 7 lines 17-51, especially lines 30-40 (use of filters to meet criterions)]**; and
- (iii) generating a representative row for each of the subsets using the image information of the rows in the respective subset, the second image formed by the representative rows and containing a version of the linear shape of the incident light **[figures 4-6 and column 7 lines 177-51, especially lines 30-40 (row interpolation for second image from filter data)]**.

(3) Regarding claim 23, similarly claim 34:

Hsu et al further teaches:

wherein generating each representative row comprises:

- processing the portion of the image information of each row in the subset **[figures 4-6 and column 7 lines 17-51, especially lines 30-40 (filtering is seen as processing portion of information)]**; and
- detecting, while processing, whether a sum of added image information for any of the columns exceeds the criterion **[figures 4-6 and column 7 lines 17-51, especially lines 30-50 (summing and other processing of data)]**.

(4) Regarding claim 24, similarly claim 35:

Hsu et al further teaches:

- wherein the processing comprises summing the portion of the image information of each row in the subset

[figures 4-6 and column 7 lines 17-51, especially lines 30-40 (summing of filter data)].

(5) Regarding claim 25, similarly claim 36:

Hsu et al further teaches:

- wherein the processing comprises performing a max operation on the portion of the image information of each row in the subset

[figures 4-6 and column 7 lines 17-51, especially lines 30-40 (highpass filtering for max image data)].

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Chasson (US 4,188,544) discloses Method and apparatus for automatically processing a workpiece employing calibrated scanning
- Daher (US 5,327,254) discloses Method and apparatus for compressing and decompressing image data

- Soest (US 5,703,960) discloses Lumber defect scanning including multi-dimensional pattern recognition
- Tsukada et al (US 5,831,748) discloses Image processor
- Chan et al (US 6.037,579) discloses Optical interferometer employing multiple detectors to detect spatially distorted wavefront in imaging of scattering media
- Ben-Dove et al (US 6,094,269) discloses Apparatus and method for optically measuring an object surface contour
- Nevis (US 6,097,849) discloses Automated image enhancement for laser line scan data
- Good et al (US 6,382,515) discloses Automated system and method for identifying and measuring packages transported through a laser scanning tunnel

(10) Response to argument

Appellant's Argument - (Brief, pages 3-4) Appellant's main argument stated more specifically, Takashi's light rays that become scattered by the space particles have not been cast "onto a specific location on an object," as is required for the "incident light" of the present claim. Because Takashi's light rays that become scattered are not "incident light," Takashi also fails to teach or suggest capturing of "light from scattering of the incident light."

Takashi also does not determine "an object scattering property for the specific location" as required by the present claims. The claims define the specific location as being on the "object"--which would be the ground in Takashi.

Because Takashi's light is scattered by space particles, it does not indicate any object scattering property of the ground. As such, Takashi determines no "object scattering property for the specific location" per the present claims.

Examiner Response – Examiner respectfully disagrees and directs the appellant especially to figure 9 and column 5 lines 25-55 of Takashi et al that teaches the claim language of claim 1.

Column 5 lines 25-55 of Takashi et al teaches the recognition of scatter and reflection of incident light and the importance of such separation would enable a good image to be recorded. Figure 9 charted the timing between scatter and reflected light, and by using the time to accurately know when to amplify which signal, reflection signal, such that the image recorded will be those of the ground and not the scatter light.

Takashi et al further teaches in figure 6-7 and column 3 line 70 to column 4 line 45 regarding capturing of light reflected from the ground surface regardless of the angle. Figure 6-7 teaches where the light from the surface are reflected back to the receiver from different angles and still able being received for processing. Examiner views such ability to obtain light coming from different angles of the surface/object is same as obtaining scatter light property of the surface/object same as that is claim by the claim invention of claim 1.

For this reason the Examiner maintains the finality of the last Office Action.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

(12) Oral Hearing

No oral hearing was requested.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Tsung-Yin Tsai/
Examiner, Art Unit 2624
May 18, 2011

Conferees:

/Vu Le/
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